

ABSTRACT OF THE DISCLOSURE

In this disclosure, a novel method for direct mode enhancement in B-pictures and skip mode enhancement in P-pictures in the framework of H.264 (MPEG-4/Part 10) is disclosed. Direct mode and skip mode enhancements are achieved by clustering the values of the Lagrangian, removing outliers and specifying smaller values of the Lagrangian multiplier in the rate-distortion optimization for encoding mode selection. Experimental results using high quality video sequences show that bit rate reduction is obtained using the method of the present invention, at the expense of a slight loss in peak signal-to-noise ratio (PSNR). By conducting two different experiments, it has been verified that no subjective visual loss is visible despite the peak signal-to-noise ratio change. In relationship to the existing rate-distortion optimization methods currently employed in the (non-normative) MPEG-4/Part 10 encoder, the method of the present invention represents a simple and useful add-on. More importantly, when other solutions such as further increasing the values of the quantization parameter are not applicable, as inadmissible artifacts would be introduced in the decoded pictures, the method of the present invention achieves bit rate reduction without introducing visible distortion in the decoded sequences. Even more, despite the fact that the present document makes use of the H.264 framework, the proposed method is applicable in any video encoding system that employs rate-distortion optimization for encoding mode selection.